

# **PALLET FOR THREE-WHEELD MOTORCYCLE**

## **Cross Reference to Related Application**

This is a continuation-in-part application of U.S. Patent Application No. 10/177,782 filed June 19, 2002.

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## **Background of the Invention**

### **1. Field of the Invention**

The present invention relates to a pallet. In particular, the present invention relates to a pallet for a three-wheeled motorcycle.

### **2. Description of the Related Art**

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The wheels of a typical three-wheeled motorcycle such as a three-wheeled beach motorcycle or a three-wheeled motorcycle for off-road use are wider and bigger than ordinary ones. The wheels are removed before the motorcycle is placed on a pallet during transportation. However, removal of the wheels before transportation and reassembly of the wheels after arrival in the destination are troublesome.

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## **Summary of the Invention**

An object of the present invention is to provide a pallet having two compartments and a positioning groove for respectively receiving two rear wheels and a front wheel of a three-wheeled motorcycle such that the motorcycle can be transported without removing the wheels.

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A pallet in accordance with the present invention includes an upper side having a front end and a rear end. Two rear wheel-receiving compartments are defined in the rear end of the upper side of the pallet. A front wheel-positioning groove is defined in the front end of the upper side of the pallet. Thus, Two rear wheels and a front wheel of a three-wheeled motorcycle can be respectively

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received and positioned in the rear wheel-receiving compartments and the front wheel-positioning groove of the pallet during transportation without the need of removing the wheels.

Other objects, advantages, and novel features of the invention will  
5 become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

### **Brief Description of the Drawings**

Fig. 1 is a perspective view of an embodiment of a pallet in accordance with the present invention.

10 Fig. 2 is an exploded perspective view of the pallet in Fig. 1.

Fig. 3 is an exploded perspective view of a modified embodiment of the pallet in accordance with the present invention.

Fig. 4 is an exploded perspective view of another modified embodiment of the pallet in accordance with the present invention.

15 Fig. 5 is a perspective view of the pallet in Fig. 4.

Fig. 6 is an exploded perspective view of a further modified embodiment of the pallet in accordance with the present invention.

Fig. 7 is an exploded perspective view of still another modified embodiment of the pallet in accordance with the present invention.

### **Detailed Description of the Preferred Embodiments**

Referring to Figs. 1 and 2, an embodiment of a pallet 1 in accordance with the present invention generally comprises an upper side 110 and an underside 120. The upper side 110 has a front end and a rear end. Two rear wheel-receiving compartments 15 are defined in the rear end of the upper side 110  
25 of the pallet 1. A front wheel-positioning groove 16 is defined in the front end of the upper side 110 of the pallet 1. Thus, two rear wheels 8 and a front wheel 9 of a

three-wheeled motorcycle such as a three-wheeled beach motorcycle or a three-wheeled motorcycle for off-road use can be received and positioned on the pallet 1 during transportation without the need of removing the wheels 8.

In this embodiment, the pallet 1 includes at least one through-hole 121  
5 (two in this embodiment) defined between the upper side 110 and the underside 120 and extending along a longitudinal direction or a lateral direction of the pallet 1. The through-holes 121 of the pallet 1 allow the forks (not shown) of a forklift to extend therethrough, allowing the forklift to move the pallet 1 to a desired location. Preferably, the rear wheel-receiving compartments 15 are respectively  
10 formed on two rear corners of the upper side 110 of the pallet 1. Preferably, the front wheel-positioning groove 16 is defined in a central portion of the front end of the upper side 110 of the pallet 1. Thus, the rear wheel-receiving compartments 15 and the front wheel-positioning groove 16 together form an isosceles triangle.

In particular, in this embodiment, the pallet 1 includes an upper plate 14, a  
15 bottom plate 11, and a plurality of support members 12 sandwiched between the upper plate 14 and the lower plate 11. The lower plate 11 is a substantially rectangular plate made of paper, and the upper plate 14 is also made of paper and includes two cutouts 142 in a rear end thereof and a slot 141 in a front end thereof. The cutouts 142 of the upper plate 14 are respectively aligned with the rear  
20 wheel-receiving compartments 15 defined by the lower plate 11 and the support members 12. The slot 141 of the upper plate 14 is aligned with the front wheel-positioning groove 16 defined by the support members 12. The respective support member 12 is preferably a rectangular tubular member or a U-shaped member to thereby define at least one through-hole 121 between the upper side  
25 110 and the lower side 120.

The pallet 1 may further include an enveloping means 13 for enveloping the lower plate 11, the upper plate 14, and the support members 12. In this embodiment, as illustrated in Fig. 2, the enveloping means 13 includes a first enveloping plate 23 for enveloping a rear end of the pallet 1 and a second enveloping plate 33 for enveloping the remaining portion of the pallet 1. The first enveloping plate 23 includes a central section 231 and two end sections 232. Each end section 232 of the first enveloping plate 23 includes three folding lines 233, 234, and 235, thereby forming a first enveloping section 236, a second enveloping section 237, and a third enveloping section 238. In use, the central section 231 of the first enveloping plate 23 lies below the rear end of the lower plate 11, with the respective first enveloping section 236 being superimposed on a bottom wall 150 delimiting the respective rear wheel-receiving compartment 15, with the respective second enveloping section 237 being superimposed on a side wall 122 of the associated support member 12, and with the respective third enveloping section 238 being superimposed on a rear portion 144 of an upper side 143 of the upper plate 14 that lies on an upper side 123 of the associated support member 12 after folding the first enveloping plate 23 along the first, second, and third folding lines 233, 234, and 235.

The second enveloping plate 33 includes a central section 331 and two end sections 332. Each end section 332 of the second enveloping plate 33 includes two folding lines 333 and 334, thereby forming a first enveloping section 336 and a second enveloping section 337. Each first enveloping section 336 has two slots 338, and each second enveloping section 337 has a cutout 339. In use, the central section 331 of the second enveloping plate 33 lies below the remaining portion of the lower plate 11, with the first enveloping section 336 being superimposed on a side wall 124 of the associated support member 12, and with

the second enveloping section 337 being superimposed on the remaining portion of the upper side 143 of the upper plate 14 after folding the second enveloping plate 33 along the first and second folding lines 333 and 334. The respective slot 338 of the second enveloping plate 33 is aligned with the respective through-hole 121. The cutouts 339 of the second enveloping plate 33 together form a slot that is aligned with the slot 141 of the upper plate 14. The enveloping means 13 becomes a part of the pallet 1 and thus improves the structural strength of the pallet 1. It is noted that all of the folding lines 233, 234, 235, 333, and 334 extend in a direction perpendicular to an extending direction of the through-holes 121 of the pallet 1.

10 In a case that the enveloping means 13 is used, the pallet 1 may further include an end plate 17 for sealing the front end of the pallet 1. This prevents the forks of the forklift to extend into the pallet 1 via the front end of the pallet 1.

Fig. 3 illustrates a modified embodiment of the enveloping means 13. In this embodiment, the enveloping means 13 includes a first enveloping plate 43 for enveloping the rear end of the pallet 1, a second enveloping plate 53 for enveloping the front end of the pallet 1, and a third enveloping plate 63 for enveloping an intermediate portion of the pallet 1.

The first enveloping plate 43 includes a bottom portion 431, an upper portion 432, and a connecting portion 436 between the bottom portion 431 and the upper portion 432. A folding line 433 is provided between the bottom portion 431 and the connecting portion 436 and extends in a direction parallel to the extending direction of the through-holes 121. Similarly, a folding line 434 is provided between the connecting portion 436 and the upper portion 432 and extends in a direction parallel to the extending direction of the through-holes 121.

25 The upper portion 432 includes a central section 437 and two end sections (not labeled). Each end section of the upper portion 432 of the first enveloping plate

43 includes two folding lines 435 extending along a direction perpendicular to the extending direction of the through-holes 121, thereby forming a first enveloping section 438 and a second enveloping section 439.

In use, the bottom portion 431 of the first enveloping plate 43 lies below  
5 the rear end of the lower plate 11, with the connecting portion 436 being superimposed on a side wall 124 of the associated support member 12, with the central section 437 of the upper portion 432 of the first enveloping plate 43 being superimposed on a rear portion 144 of an upper side 143 of the upper plate 14, with the respective first enveloping section 438 of the first enveloping plate 43  
10 being superimposed on another side wall 122 of the associated support member 12, and with the respective second enveloping section 439 of the upper portion 432 of the first enveloping plate 43 being superimposed on a bottom wall 150 delimiting the associated rear wheel-receiving compartment 15 after folding the first enveloping plate 43 along the folding lines 433, 434, and 435. The  
15 connecting portion 436 of the first enveloping plate 14 may include at least one slot 430 that aligns with at least one hole 121a defined in the associated support member 12.

The second enveloping plate 53 includes a bottom portion 531, a connecting portion 536, and an upper portion 532. A folding line 533 is provided  
20 between the bottom portion 531 and the connecting portion 536 and extends in a direction parallel to the extending direction of the through-holes 121. Similarly, a folding line 534 is provided between the connecting portion 536 and the upper portion 532 and extends in a direction parallel to the extending direction of the through-holes 121. The upper portion 532 includes a central section 537 and two  
25 end sections (not labeled). Each end section of the upper portion 532 of the second enveloping plate 53 includes a folding line 535 extending along a

direction perpendicular to the extending direction of the through-holes 121, thereby forming an enveloping section 538. The central section 537 of the upper portion 532 of the second enveloping plate 53 includes a cutout 530 in a center thereof.

5           In use, the bottom portion 531 of the second enveloping plate 53 lies below the front end of the lower plate 11, with the connecting portion 536 being superimposed on a side wall 124 of the associated support member 12 (or the end plate 17, if used), with the central section 537 of the upper portion 532 of the second enveloping plate 53 being superimposed on a front portion 146 of the  
10   upper side 143 of the upper plate 14, and with the respective enveloping section 538 of the second enveloping plate 53 being superimposed on another side wall 122 of the associated support member 12 after folding the second enveloping plate 53 along the folding lines 533, 534, and 535.

          The third enveloping plate 63 includes a central portion 631 and two end  
15   portions 632. Each end portion 632 of the third enveloping plate 63 includes two folding lines 633 and 634, thereby forming a first enveloping section 636 and a second enveloping section 637. Each first enveloping section 636 has two slots 638, and each second enveloping section 637 has a cutout 639.

          In use, the central portion 63 of the third enveloping plate 63 lies below  
20   an intermediate portion of the lower plate 11, with the first enveloping section 636 of the third enveloping plate 63 being superimposed on a side wall 124 of the associated support member 12 and with the second enveloping sections 637 being superimposed on an intermediate portion 145 of the upper plate 14. The respective slot 638 of the third enveloping plate 63 is aligned with the respective  
25   through-hole 121 of the associated support member 12. The cutout 530 of the second enveloping plate 53 and the cutouts 639 of the third enveloping plate 63

together form a slot that is aligned with the slot 141 of the upper plate 14. The enveloping means 13 becomes a part of the pallet 1 and thus improves the structural strength of the pallet 1.

Figs. 4 and 5 illustrate another modified embodiment of the enveloping means 13. In particular, the enveloping means 13 and the lower plate 11 of the first embodiment are combined together in this embodiment. More specifically, the lower plate 11 includes a pair of flips 73 respectively extending from two opposed sides thereof. A folding line 733 is provided between the respective flip 73 and the lower plate 11. Each flip 73 includes a front section 732 and a rear section 731 that can be separated from the front section 732 along a separation line 730. A further folding line 734 is provided in the front section 732 of each flip 73, thereby forming a first enveloping section 736 and a second enveloping section 737. Each first enveloping section 736 includes two slots 738, and each second enveloping section 737 includes a cutout 739. Each rear section 731 includes two folding lines 740 and 741, thereby forming a third enveloping section 742, a fourth enveloping section 743, and a fifth enveloping section 744.

In use, the lower plate 11 placed below the support members 16 is folded along the folding lines 733, 734, 740, and 741, with the respective first enveloping section 736 being superimposed on a side wall 124 of the associated support member 12, with the respective second enveloping section 737 being superimposed on a front portion 148 of the upper side 143 of the upper plate 14, with the respective third enveloping section 742 being superimposed on a respective corner 111 of a rear portion of the lower plate 11, with the respective fourth enveloping section 743 being superimposed on a side wall 122 of the associated support member 12, and with the respective fifth enveloping section 744 being superimposed on a rear portion 144 of the upper side 143 of the upper



plate 14. The respective slot 738 is aligned with the respective through-hole 121, and the cutouts 739 together form a slot that is aligned with the slot 141 of the upper plate 14.

Fig. 6 illustrates a modified embodiment that is modified from the embodiment of Fig. 4. In this embodiment, the support members 12 are blocks  
5 securely fixed on the upper side of the lower plate 11.

Fig. 7 illustrates another modified embodiment in which the enveloping means 13 is omitted. Further, the support members 16 in this embodiment are so constructed that two through-holes 121a extending along a direction  
10 perpendicular to the through-holes 121 are formed. This allows the forks of a forklift to extend through the through-holes 121a when desired.

Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the invention as  
15 hereinafter claimed.